



The Twenty-Four Hour Notation.

The following documents are printed for the information of all concerned in advancing the successful operation of Railways, and in promoting the general public convenience.

They show, why, and how, and with what results, the twenty-four hour notation has been tested experimentally on 2,600 miles of Railway, since July 1st, 1886.

They establish that there are great advantages in the use of the new notation in operating Railways. They show that it is quite easily introduced; that business men and the general public accept the change with remarkable readiness.

This experimental trial of the new notation has proved so successful that it has been decided to adopt it permanently on every division of the Canadian Pacific Railway and on other Railways connecting therewith.

The documents herewith submitted undoubtedly indicate that the twenty-four hour system, must inevitably come into use on every Railway in America, and be accepted sooner or later by the whole community.

LIST OF DOCUMENTS.

1. Report of the Special Committee on Uniform Standard Time, of the American Society of Civil Engineers, presented at the annual meeting in New York, 19th January, 1887.
2. Circular issued when the twenty-four hour notation was first introduced on the Canadian Pacific Railway, dated June 10th, 1886.
3. Condensed time table for the line from Lake Superior to the Pacific Coast, operated on the twenty-four hour notation.
4. Letter from W. C. Van Horne, Vice-President Canadian Pacific Railway, on the use of the new notation for six months, January 7th, 1887.
5. Letter from W. Whyte, General Superintendent Western Division, Canadian Pacific Railway, January 1st, 1887.
6. Letter from C. Shields, Assistant Superintendent, Medicine Hat, December 17th, 1886.
7. Letter from J. N. Niblock, Assistant Superintendent, Port Arthur, December 13th, 1886.
8. Letter from J. A. Cameron, Train Master, Winnipeg, December 16th, 1886.
9. Letter from A. Allan, Chief Train Dispatcher, Port Arthur, December 8th, 1886.
10. Letter from C. D. Kevin, Chief Train Dispatcher, Medicine Hat, December 10th, 1886.
11. Letter from Geo. Thompson, Conductor, Winnipeg, December 14th, 1886.
12. Letter from W. H. Fogg, Conductor, Winnipeg, December 13th, 1886.
13. Letter from L. H. Sullivan, Conductor, Winnipeg, December 7th, 1886.
14. Letter from C. McLennan, Conductor, Fort William, December 11th, 1886.
15. Letter from P. A. Bogue, Agent, Port Arthur, December 10th, 1886.

16. Letter from F. Western, Agent, Fort William, December 6th, 1886.
17. Letter from R. Reading, Agent, Rat Portage, December 16th, 1886.
18. Letter from Ed. W. Chapman, Yard Master, Rat Portage, December 14th, 1886.
19. Letter from H. L. Bell, Agent, Ignace, December 3rd, 1886.
20. Letter from W. C. Burns, Agent, Pilot Mound, December 14th, 1886.
21. Letter from J. F. Hunter, Agent, Crystal City, December 15th, 1886.
22. Letter from J. H. Longworth, Agent, Portage la Prairie, December 15th, 1886.
23. Letter from J. A. Kammerer, Agent, Indian Head, November, 24th, 1886.
24. Letter from C. O. Davidson, Agent, Wolseley, November 24th, 1886.
25. Letter from W. C. Fowler, Agent, Regina, November 29th, 1886.
26. Letter from E. B. Fowler, Agent, Calgary, December 16th, 1886.
27. Letter from W. A. Killien, Agent, Banff, November 25th, 1886.
28. Letter from C. E. Wells, Agent, Golden City, November 23rd, 1886.
29. Letter from F. W. Peters, Agent, Brandon, December 13th, 1886.
30. Letter from J. Murray, December 18th, 1886.
31. Letter from the Mayor of Port Arthur, December 30th, 1886.
32. Letter from the Mayor of Brandon, November 23rd, 1886.
33. Letter from the Mayor of Winnipeg, November 17th, 1886.
34. Letter from Acton Burrows, President Manitoban Company, January 3rd, 1887.
35. Letter from W. R. Baker, General Superintendent M. & N. W. Railway, November 20th, 1886.
36. Letter from E. T. Galt, Manager North-Western Coal & Navigation Co., December 1st, 1886.
37. Letter from J. Baily, Superintendent North-Western Coal & Navigation Co., November 25th, 1886.
38. Letter from T. D. Kevin, Train Dispatcher, North-Western Coal & Navigation Co., November 18th, 1886.
39. Letter from Thos. G. Shaughnessy, Assistant General Manager C.P.R., January 7th, 1887.
40. Letter from the Hon. J. Norquay, Premier, Province of Manitoba, January 9th, 1887.

41. Letter from the Hon. J. C. Aikins, Lieut.-Governor, Province of Manitoba, January 10th, 1887.
 42. Letter from Collingwood Schreiber, Chief Engineer and General Manager Canadian Government Railways, January 15th, 1887.
 43. Resolutions of the American Society of Civil Engineers, New York, 19th January, 1887.
 44. Note on the old usage and the new Notation.
 45. Railway Superintendents, Managers, Presidents, &c. heard from favourable to the 24 hour notation and ready at the proper time to adopt it.
 46. Scientists and other prominent persons in favour of the new notation. List published in 1884.
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No. 1.

REPORT OF THE SPECIAL COMMITTEE ON STANDARD TIME AT THE ANNUAL MEETING

AMERICAN SOCIETY OF CIVIL ENGINEERS.

NEW YORK, JANUARY 19TH, 1887.

At the last annual meeting the committee referred to the progress made at that date in the movement of time reform. Among other things the report mentioned the fact that it was publicly announced that the Canadian Pacific Railway Company had decided to test the advantages claimed for the 24 hour system of notation by an actual trial on a portion of their trans-continental line.

Accordingly at mid-summer last year when the through line was opened for public traffic, the time tables were arranged for the change of notation between Port Arthur on Lake Superior and Vancouver on the Pacific Coast. This portion of the railway comprises the Western and Pacific Divisions, 1,913 miles of main line, which together with branches and connections using the new system, embrace in all over 2,600 miles of railway. It extends across the "Central," the "Mountain" and the "Pacific" standard time zones, being those governed by the time of the 90th, the 105th and 120th Meridians of west longitude. The management of the railway company deemed it expedient to test the new notation experimentally on those divisions before adopting it on the whole line.

The Vice-President, Mr. VanHorne, has placed at the service of the committee a large number of letters received on the subject from the principal officers on the Western Division, conductors and agents, mayors of cities, the Lieut.-Governor and the Premier of Manitoba and others. These letters furnishing information as to the results of the experiment during six months which have intervened, are herewith submitted. They are obviously from shrewd practical business men, whom it may be assumed are in no way influenced by any sentimental desire for the introduction of a novel and hitherto untried system of reckoning time. On the other hand it is reasonable to suppose that the writers of the letters would partake of the same dislike to a departure from an old established custom, which is natural to the majority of people. However that may be, their attachment to the

traditional usage has been completely over-balanced by the inherent merits of the new notation.

The letters appended afford overwhelming testimony on two points, viz:—

1st. The great advantages of the twenty-four hour system in operating railways.

2nd. The readiness with which business men and the general public accept the change.

It is surprising that people should with so little hesitation abandon a usage with which they have been familiar from childhood, to adopt what may be looked upon as an innovation. The circumstances may be taken as an evidence of the intelligent appreciation by the general public of the advantages of the new notation. So far not a single voice has been heard against its use, the newspaper press has everywhere advocated the change, and no person whatever throughout the vast territory has expressed a desire to return to the old system of reckoning.

The experiment of the last six months has determined the Canadian Pacific Railway Company to adopt the twenty-four hour system *permanently*, on every Division, every Branch and every connecting line under its control. The next time tables issued will extend the use of the new notation eastward to Toronto and to Ottawa, the Capital of the Dominion. In another year when the extensions of the Pacific Railway will be completed, it is expected that the twenty-four hour system will be put in force within the limits of every Province of Canada, from Nova Scotia on the Atlantic to British Columbia on the Pacific.

This practical test is undoubtedly an out-come of the action taken by the American Society of Civil Engineers during the past six years. The signal success which has attended the experiment is a first fruit of the movement, which clearly points to most important results in the not distant future. It appears to the committee to settle every objection of any consequence which has at any time been raised, and fore-shadows the ultimate general adoption of the new notation.

The committee respectfully suggest that the accompanying documents be printed and widely circulated for the information of all concerned in the successful operation of our gigantic continental railway system.

SANDFORD FLEMING,

HOUSE OF THE SOCIETY,

Chairman.

NEW YORK January 17th, 1887.

No. 2.

Circular issued when the Twenty-Four Hour Notation was First Introduced on the CANADIAN PACIFIC RAILWAY.

MONTREAL, June 10th, 1886.

In view of the new conditions that have to be met by this Company in establishing a continuous train-service on a line of railway covering fifty-three degrees of longitude and soon to cover sixty degrees (or four hours of time), it is necessary for convenience and to avoid confusion, to adopt what is known as the "twenty-four hour system," that is, to substitute the numbers 13 to 24 for the present P.M. hours 1 to 12, so that the hours from midnight to midnight will be numbered from 1 to 24.

A large majority of the Railway Managers of Canada and the United States have formally expressed their opinion in favour of the "twenty-four hour" system, and this opinion is concurred in by the public press and by all the leading scientific men of the continent.

The wisdom of the adoption of the "Standard Time" system, which is now used throughout North America is no longer disputed, and it is only a question of a very short time when the "twenty-four hour" system will be as generally followed. It will be an honour to Canada to take the lead in this important reform. The Directors in taking this step hope for the approval of the public and the hearty co-operation of all the employees of the company.

It is intended to make the change first on all the lines of the company west of Lake Superior, beginning with the next change in timetables.

Paper dials with the new afternoon numbers will be furnished both for clocks and watches free of charge to the public as well as to employees of the company.* These dials may be easily applied to any watch or clock by following the directions accompanying the circular. Arrangements will be made at the different divisional points for their application to the watches of employees, and those who are unable to

* These paper dials are made of thin white paper, of sufficient size to contain the new afternoon hours, 13 to 24, to be inserted within the existing Roman numerals, I to XII. They are cut to the proper size, pierced for the axis of the hands, coated with gum and ready for application as explained in the accompanying directions.

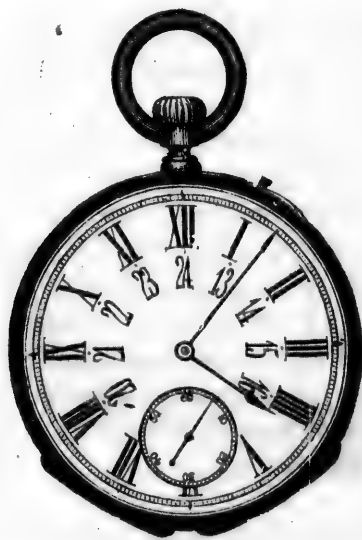
have them applied by the persons appointed for the purpose may obtain them from any agent of the company. Those requiring dials for clocks should state the diameter of the clock dials inside of the present figures.

W. C. VAN HORNE,

Vice-President.

It has been decided to adopt the twenty-four hour system on the Western and Pacific Divisions, being that portion of the line west of Port Arthur.

The following cut will explain the system. The A.M and P.M. will be abolished, and the hours from noon to midnight will be from 12 to 24 o'clock.



EASTERN TIME is adopted on all parts of the line east of Port Arthur.

CENTRAL TIME, Port Arthur to Broadview.

MOUNTAIN " Broadview to Donald.

PACIFIC " Donald to Vancouver.

Thus, when it is 12 noon at Montreal, - - Eastern time.

It is 11 o'clock at Brandon, - Central "

" 10 " " Regina, - Mountain "

" 9 " " Vancouver, - Pacific

Directions for Applying Extra Dials for the "Twenty-Four Hour System."

If the watch or clock has a second hand, a segment should be removed from the extra dial to make room for it as shewn on the diagram.

For applying the new dial, moisten every part of its gummed surface, then carefully place it in position and press it on evenly and firmly so that every portion will adhere. Unless this is done the new dial may scale off or blister and interfere with the hands.

The best time to apply the new dial will be at half-past four, half-past five, half-past six or half-past seven, when both the hour and minute hands are out of the way.

No. 3.

Condensed Time Table for that portion of the Trans-Continental line between Lake Superior and the Pacific Coast operated on the twenty-four hour notation.

TIME.		Miles from Montreal.	PRINCIPAL STATIONS.	TIME.
Central Standard Time.	15:10	993	Lv.... PORT ARTHUR.... Ar.	11:45
	15:30	1000	 FORT WILLIAM	11:28
	17:40	1052	 DEXTER	9:23
	18:20	1069	 SAVANNE	8:45
	21:30	1145	 IGNACE	5:50
	24:38	1235	 EAGLE RIVER	2:35
	1:33	1249	 PARRYWOOD	1:33
	3:38	1290	 RAT PORTAGE	23:32
	5:52	1342	 RENNIE	21:01
	6:40	1362	 WHITEMOUTH	20:10
	8:10	1402	 SELKIRK	18:40
	9:10	1423	 WINNIPEG	17:50
	10:43	1452	 MARQUETTE	16:08
	11:48	1479	 P. LA PRAIRIE	15:05
	12:37	1500	 MCGREGOR	14:15
	14:10	1529	 CARBERRY	13:10
	15:20	1556	 BRANDON	11:45
	16:35	1589	 OAK LAKE	10:16
	18:38	1642	 MOOSOMIN	8:11
Mountain Standard Time.	19:40	1687	 BROADVIEW	6:30
	20:58	1717	 WOLSELEY	3:38
	22:16	1747	 QU'APPELLE	2:17
	23:45	1779	 REGINA	25:50
	24:25	1789	 GRAND COULEE	24:25
	2:00	1821	 MOOSE JAW	22:25
	7:00	1934	 SWIFT CURRENT	18:05
	11:10	2020	 MAPLE CREEK	14:05
	14:20	2083	 MEDICINE HAT	11:15
	16:53	2136	 TILLEY	8:44
	18:36	2173	 LATHOM	7:07
	20:25	2208	 GLEICHEN	5:35
	22:50	2262	 CALGARY	3:00
	2:25	2329	 CANMORE	24:01
	3:03	2342	 BANFF	23:18
	4:00	2361	 SILVER CITY	22:28
	5:25	2385	 STEPHEN	21:17
	6:50	2395	 FIELD	20:25
Pacific Time.	9:03	2429	 GOLDEN CITY	17:55
	9:00	2446	 DONALD	17:10
	11:57	2482	 GLACIER HOTEL	13:28
	16:05	2525	 REVELSTOKE	9:15
	18:56	2559	 SICAMOUS	6:14
	23:10	2654	 KAMLOOPS	2:10
	1:43	2699	 ASHCROFT	23:25
	4:29	2748	 LYTTON	20:35
	6:10	2775	 NORTH BEND	19:00
	8:55	2824	 RUBY CREEK	16:05
	12:00	2892	 PORT MOODY	13:00
		2906	Ar.... VANCOUVER.... Lv.	

No. 4.

Letter from the Vice-President and General Manager CANADIAN
PACIFIC RAILWAY CO.

MONTREAL, 7th January, 1887.

My Dear Mr. FLEMING,

You will be interested in knowing how the 24-o'clock system has worked so far on our line and how it has been received by the public. I, therefore, send you the enclosed letters on the subject which have been forwarded to me by the General Superintendent of our Western Division. From personal enquiries and observations, I am happy to be able to confirm the most favourable reports of the working of the system. We have found it most convenient and useful, and I think we will be ready on the issue of our next time bill to extend it over all of our lines and have reason to believe that it will be adopted very soon by a number of neighbouring lines in Central Canada as has already been done by two independent railway companies in Manitoba and the North-West Territories.

Yours very truly,

W. C. VAN HORNE,

Vice-President.

MR. SANDFORD FLEMING, C.M.G., C.E.,
Ottawa.

No. 5.

CANADIAN PACIFIC RAILWAY COMPANY.

WESTERN DIVISION.

OFFICE OF THE GENERAL SUPERINTENDENT.

WINNIPEG, Man., 1st January, 1887.

W. C. VAN HORNE, Esq.,

Vice-President, Montreal.

Dear Sir,

Referring to yours of the 7th ult. I enclose herewith a large number of letters from Assistant Superintendents, Conductors, Dispatchers, Agents and others, who, as you will observe, all endorse the 24-hour system of reckoning time. From these letters it is evident that the new system is steadily coming into general use throughout this country. It has already been adopted at nearly all the important towns and is most favorably looked upon everywhere along the line. The only

objection which has ever been advanced against it, is, that it is new and unlike the old system, but this objection has to a large extent passed away.

Both the Manitoba & North Western Railway Company and the North-West Coal & Navigation Company have adopted the twenty-four hour system, and I enclose letters from Mr. Baker and Mr. Galt regarding same.

My own opinion is that it will in course of time become universal; at present some sections of the country have not taken kindly to it as they consider it an innovation on an old established custom, but it is only a matter of time when they will get used to the new system and wonder they did not approve of it before.

From a railway standpoint it is infinitely superior to the old system; it simplifies the issuing of train orders and makes the movement of trains under our telegraph system much safer, and anything which contributes to the safety of the travelling public is of course for the general good of the community.

Yours truly,

W. WHYTE,

General Superintendent.

No. 6.

CANADIAN PACIFIC RAILWAY COMPANY.

ASSISTANT SUPERINTENDENT'S OFFICE.

MEDICINE HAT, N.W.T., December 17th 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

With respect to the introduction, on this Division, of the twenty four hour system of recording time, I have to say:

That in the handling of trains I have found it to be infinitely safer than the old, or twelve hour system, there being much less liability to errors, both in train orders and in the interpretation of time schedules. Its simplicity is obvious, in that, from the first day of its adoption I have not found an employee connected with the transportation department who has not readily comprehended it.

From conversation with employees, and from interviews with citizens, at the different stations along the line, I learn that the new system is gradually being adopted by the public, and that where adopted it is generally appreciated and recognized to be a much simpler, and therefore better, system of recording time. I would also mention that the twenty-four hour system has, universally, been adopted by the press throughout the territories.

In conclusion I have only to say that I consider the new system immeasurably preferable to the old, and that, owing to the many benefits arising from its use, it cannot but, eventually, be adopted by everyone looking to his own convenience and to the safer handling of trains by railway corporations.

Yours truly,

C. SHIELDS,

Assistant Superintendent.

No. 7.

CANADIAN PACIFIC RAILWAY COMPANY.

ASSISTANT SUPERINTENDENT'S OFFICE.

PORT ARTHUR, December 13th, 1886.

W. WHYTE, Esq.,

General Superintendent, Winnipeg.

Dear Sir,

With reference to the twenty-four hour system, I now enclose letters from Chief Train Dispatcher, Trainmaster and agents, which will speak for themselves. I don't know that there is much left for me to say beyond the fact that I certainly think it an excellent change. There is as much difference between it and the old system as there is between the system of dollars and cents and pounds, shillings and pence.

We have, perhaps, not got as rapidly into it at this end, as further west, on account of it not having been yet adopted on the Eastern Division, which necessitates our working to a certain extent on both systems. If the system is adopted along the whole line it will be a grand success.

Yours truly,

J. NIBLOCK,

Superintendent.

No. 8.

CANADIAN PACIFIC RAILWAY COMPANY.

WESTERN DIVISION.

TRAIN MASTER'S OFFICE, RAT PORTAGE AND THUNDER BAY SECTIONS.

WINNIPEG, December 16th, 1886.

J. NIBLOCK, Esq.,
Superintendent, Port Arthur.

Dear Sir,

In regard to the twenty-four hour system of computing time, at present in vogue on the Western Division of this line, I wish to say that I consider it a very decided improvement on the old system for various reasons, at the same time I think that its universal adoption will be necessary in order to make it a complete success in every respect. As regards the movement of trains it has been found to be very satisfactory, having many advantages, and of its disadvantages I have yet to learn.

The general public no doubt are somewhat confused in travelling over the line from the East to meet with it first on the Western Division, but I firmly believe that if it were adopted on the several divisions of the road it would be found a grand success.

Yours truly,

J. A. CAMERON,

Train Master.

No. 9.

CANADIAN PACIFIC RAILWAY COMPANY.

WESTERN DIVISION.

CHIEF TRAIN DESPATCHER'S OFFICE.

PORT ARTHUR, December 8th, 1886.

J. NIBLOCK, Esq.,
Superintendent.

Dear Sir,

In answer to your enquiry regarding our twenty-four hour system, I very much prefer it to the old twelve hour system, and believe it may be adopted generally on the line with as much advantage as here.

Yours truly,

A. ALLAN.

Chief Train Dispatcher.

No. 10.

CANADIAN PACIFIC RAILWAY COMPANY.

MEDICINE HAT, December 10th, 1886.

W. WHYTE, Esq.,

General Superintendent, Winnipeg.

Dear Sir,

In compliance with Superintendent's request to state my opinion regarding the twenty-four hour system, I beg to say that I am strongly in favor of it. Since its adoption on this Division about five months ago, I have found this system of material convenience in moving trains, and consider it more conducive to safety than the old system.

Respectfully,

D. KEVIN,

Chief Train Dispatcher.

(Between Broadview and Medicine Hat.)

No. 11.

CANADIAN PACIFIC RAILWAY COMPANY.

WINNIPEG, December 14th, 1886.

Mr. CAMERON,

Train Master.

Dear Sir,

With regard to the twenty-four hour system for movement of trains—I consider it is an improvement on the twelve hour system. I find when running on Time Orders the new system has a decided advantage over the old system.

I have not been in charge of any work trains since the new system came into use, but I should judge that they could be run with greater ease and safety under the new than under the old system.

Yours truly,

GEO. THOMPSON,

Passenger Conductor.

No. 12.

CANADIAN PACIFIC RAILWAY COMPANY.

WINNIPEG, December 13th, 1886.

J. NIBLOCK, Esq.,

Superintendent, Port Arthur.

Dear Sir,

Having had about six months' experience of the twenty-four hour system, I have only one fault to find, and that is when passengers from the eastern provinces ask the time, and you tell them it is 20 or 23 o'clock, they are surprised and want an explanation. But I find it very good in the running of trains, as it does away with a.m. and p.m. I think in course of time it will be satisfactory to all. The above fault is all I have against it.

Yours truly,

W. H. FOGG,

Passenger Conductor.

No. 13.

CANADIAN PACIFIC RAILWAY COMPANY.

WINNIPEG, December 7th, 1886.

J. NIBLOCK, Esq.,

Superintendent, Port Arthur.

Dear Sir,

In *re* the twenty-four hour time system now in use on the C.P.R., I will say I think it far superior to the old style of reckoning, for many reasons too numerous to mention. The only fault I find with it is that as the travelling public from a distance do not use it to any great extent, as a general rule I find that when a passenger asks me what time it is, and I tell them 18.20, for instance, they don't know what I mean, then I have to explain about the twenty-four hour system. Otherwise I find the system all right.

Respectfully yours,

L. H. SULLIVAN,

Passenger Conductor.

No. 14.

CANADIAN PACIFIC RAILWAY COMPANY.

FORT WILLIAM, December 11th, 1886.

MR. JOHN NIBLOCK,
Port Arthur.

Dear Sir,

Respecting the twenty-four hour system I can only say that after working under it for now nearly six months, I consider it in every way preferable to the old style which it supplanted. The most obvious advantage it presents is the doing away with a.m. and p.m. Likewise doing away with any possibility of mistaking the time in "train orders." From personal observation, as well as from conversation with others, I am convinced that the only inconvenience that may at present exist arises from its limited adoption. This inconvenience in no way affects railway service, but merely applies to the travelling public coming for the first time on this Division of the Railway and meeting with the change of system. Its universal adoption combined with the use of standard time cannot fail, in my estimation, to prove most advantageous to railway service.

Yours truly,

C. McLENNAN,

Freight Conductor.

No. 15.

CANADIAN PACIFIC RAILWAY COMPANY.

PORT ARTHUR, December 10th, 1886.

J. NIBLOCK, Esq.,
Superintendent.

Dear Sir,

Your enquiry re the working of the twenty-four hour system. In my department I have found it quite a material benefit, as it facilitates all our work and there is no danger of any misapprehension or misunderstanding the hour intended. There is no possibility of an error being made in mistaking the hours of a. m. for p. m., and there is no room for doubt that it adds to safety in the operation of the road

Since the adoption of this system by the Company, it has come into almost general use by the public in this vicinity in business affairs, and you can notice by the public prints that notices of meetings &c., are advertised generally according to the twenty-four hour system. The business men here are in favor of the twenty-four hour system.

Yours truly,

P. A. BOGUE,

Agent.

No. 16.

CANADIAN PACIFIC RAILWAY COMPANY.

FORT WILLIAM, December 6th, 1886.

JNO. NIBLOCK, Esq.,

Superintendent, Port Arthur.

Dear Sir,

Referring to your letter of the 30th ultimo, I beg to state that the adoption of the twenty-four hour system in this vicinity has proved a decided success; not only has the Company adopted it but the public generally. It is found a material convenience in the operation of the Railway and is conducive to the safety of running trains.

Yours truly,

F. WESTERN,

Agent.

No. 17.

CANADIAN PACIFIC RAILWAY COMPANY.

RAT PORTAGE, December 4th, 1886.

J. NIBLOCK, Esq.,

Superintendent, Port Arthur.

Dear Sir,

In reply to your enquiry re the working of the twenty-four hour system, I would say that it has been found a great convenience, and is without doubt conducive to a greater degree of safety in the operation of the railway. It is looked upon with favor by all hands connected with the movement of trains, and also by the public in this vicinity, who have generally adopted the system, and comment favorably upon the

disuse of a.m. and p.m., which was found confusing to many persons: in trying to make out upon a time table how long it would take to go from one point to another when the distance is a long one. I consider it will be a good thing when the system shall be adopted generally on the Continent of America.

Yours truly,

R. READING,

Agent..

No. 18. /

CANADIAN PACIFIC RAILWAY COMPANY.

RAT PORTAGE, December 14th, 1886.

J. NIBLOCK, Esq.,

Superintendent.

Dear Sir,

Being asked what I think of the twenty-four hour system of computing time, I must say I consider it as much preferable to the old way as the decimal system of counting money is to £ s. d. There is no possibility of making a mistake as to what hour in the twenty-four is meant when one is mentioned, and the a.m. and p.m. being abandoned one does not have to puzzle in columns of figures in a time card whether 10 p.m. means 10 p.m. tomorrow night or the night after.

The public do not ask any questions when told a train leaves at 23.32, at least not at this station.

The main objection to the new time, with the few people who do not like it, seems to be that it is not like the old.

Many people do not like anything they are not used to, because in adopting a new thing it becomes necessary to learn something of it, and labor, even light mental labor, is distasteful to many people.

Yours truly,

E. H. CHAPMAN,

Yard Master, Rat Portage.

No. 19.

CANADIAN PACIFIC RAILWAY COMPANY.

IGNACE, December 3rd, 1886.

J. NIBLOCK, Esq.,

Superintendent, Port Arthur.

Dear Sir,

In answer to enquiries regarding the working of the twenty-four hour sysem, I beg to say, since its adoption by the Company I have found it to answer admirably in every respect.

To employees it is attended with more convenience and safety and is looked upon by the people of this vicinity as being more suitable in every sense than the old system.

Yours respectfully,

H. L. BELL,

Agent.

No. 20.

CANADIAN PACIFIC RAILWAY COMPANY.

PILOT MOUND, December 14th, 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

I would say the citizens of this town and immediate settlement have the twenty-four hour system in use, and appear to have become well acquainted with the same.

The settler at a distance from the line, I find, does not practically understand the system yet, but I find less trouble in explaining it each day.

Yours truly,

W. C. BURNS,

Agent.

No. 21.

CANADIAN PACIFIC RAILWAY COMPANY.

CRYSTAL CITY, December 15th, 1886.

W. WHYTE, Esq.,

General Superintendent, Winnipeg.

Dear Sir,

The twenty-four hour system is not yet generally adopted through this section on account of there being so many twelve hour system time-pieces.

From what I can learn the twenty-four hour system is very favorably regarded by the public and especially so for railway work.

Yours truly,

J. F. HUNTER,

Agent.

No. 22.

CANADIAN PACIFIC RAILWAY COMPANY.

PORTAGE LA PRAIRIE, December 15th, 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

In this vicinity the twenty-four hour system has not been generally adopted by the public ; but, at the same time, they appear to understand it perfectly, when making inquiries about trains, especially among the younger class of the people. I am of the opinion that if it is continued by the Company, it will be universally adopted by the community before long.

Yours truly,

J. H. LONGWORTH,

Agent.

No. 23.

CANADIAN PACIFIC RAILWAY COMPANY.

INDIAN HEAD, November 24th, 1886.

W. WHYTE, Esq.,

General Superintendent, Winnipeg.

Dear Sir,

The twenty-four hour system is in general use by the public here. Although novelty does not seem to wear off, it is increasing in favor.

My opinion is that if the Railway Company continues its use it will be wholly adopted by the people here.

Yours truly,

J. A. KAMMERER,

Agent.

No. 24.

CANADIAN PACIFIC RAILWAY COMPANY.

WOLSELEY, November 24th, 1886.

W. WHYTE, Esq.,

Gen. Supt., Winnipeg.

Dear Sir,

Referring to yours of November 22nd, I beg to inform you that notwithstanding the short time during which the twenty-four hour system of reckoning time has been in force, it has been almost universally adopted by the public in this vicinity. Of course there are many residing at a distance from the station who still adhere to the former system, but there is no doubt whatever that they will gradually fall in with the new plan.

For myself, I think it is infinitely superior to the old system, being more convenient, more simple, and preferable in every respect. I have heard a great many in my neighborhood express the same opinion.

Yours truly,

C. O. DAVIDSON,

Agent.

No. 25.

CANADIAN PACIFIC RAILWAY COMPANY.

REGINA, November 29th, 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

I am pleased to note that the twenty-four hour system is talked of with great favor. Those who have adopted the system declare it preferable to the former one. I have spoken to a large number of our people on the subject, and have not met with a single person objecting to the new system. With regard to this district it is pretty generally used, and I feel certain that every individual in the district will adopt it within a very short time.

Yours truly,

W. C. FOWLER,

Agent.

No. 26.

CANADIAN PACIFIC RAILWAY COMPANY.

CALGARY, December 16th, 1886.

W. WHYTE, Esq.,

Gen. Supt. W. D., Winnipeg.

Dear Sir,

With regard to the twenty-four hour system, am pleased to state that its adoption is being and has been spoken of with great praise, credit being given the inventor by the travelling public, and to the Company for the prompt steps they have taken in putting before the public this useful system. I have not as yet met with one individual who does not approve of it greatly, and considers it far superior to the former system, there being less liability to error, than under the old, which in many cases caused passengers to miss trains owing to a misunderstanding as to time of their arrival and departure, arising from the use of a.m. and p.m. With the present system they find no difficulty whatever in this respect. It is being used by the largest portion of

private and business houses of the city, and is generally spoken of as being much preferable to the twelve hour system. I feel certain the new system will be adopted generally by every individual in this community in the near future.

Yours truly,

E. B. FOWLER,

Agent.

No. 27.

CANADIAN PACIFIC RAILWAY COMPANY.

BANFF, November 25th, 1886.

W. WHYTE, Esq.,

Gen. Supt., Winnipeg.

Dear Sir,

The twenty-four hour time system is being used and appreciated by many of the public in this vicinity, and the number is constantly increasing. It is found to be superior to the old system as there are no mistakes possible in its use. My own experience is that it is superior in every respect to the old time system. In its use I experience no difficulty with the travelling public, as I often have had formerly through passengers not understanding a.m. and p.m., and thereby missing trains. I sincerely hope its use will become general.

Yours truly,

W. A. KILLIEN,

Agent.

No. 28.

CANADIAN PACIFIC RAILWAY COMPANY.

GOLDEN CITY, B. C., November 23rd, 1886.

WM. WHYTE, Esq.,

General Superintendent, Winnipeg.

Dear Sir,

With regard to the twenty-four hour system adopted by this Company I would say that the public in this vicinity look upon it with favor, and I have no doubt would be pleased if it became universal. Its superiority

over the old twelve hour measure must be apparent to all, especially in those time cards and folders issued by railway companies for information and guidance to the travelling public. With the old system confusion is often caused by the necessity for using a.m. and p.m., day and night often being confounded. This is entirely avoided by the twenty-four hour system. The information on the time cards is now so explicit that it is easily understood by everyone. The new system is also of greater use in moving trains by telegraph. These facts understood, the wisdom of its adoption is at once made manifest.

Yours truly,

C. E. WELLS, *Agent*.

No. 29.

CANADIAN PACIFIC RAILWAY COMPANY.

BRANDON, December 13th, 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

In reference to the working of the twenty-four hour system at this point, I beg to say, that while it has not been entirely adopted by the public, except those immediately connected with the Road, it has become tolerably familiar to the majority of the people, particularly to those who travel. We have ceased to hear comments upon it, to any extent, by those enquiring the time of arrival or departure of trains, &c., which goes to show they are getting accustomed to the system, and any comments we do hear are anything but unfavorable.

Yours truly,

F. W. PETERS, *Agent*.

No. 30.

CANADIAN PACIFIC RAILWAY COMPANY.

WESTERN DIVISION.

ASSISTANT SUPERINTENDENT'S OFFICE.

WINNIPEG, MAN., December 18th, 1886.

W. WHYTE, Esq.,

General Superintendent.

Dear Sir,

In reply to yours of December 4th, regarding the twenty-four hour

system, I attach replies from a number of agents along the line. From the tenor of their replies and my own observation I judge that amongst people who have become most familiar with it, especially the travelling public, it is most favorably regarded, and that it is only a question of time when it will be universally used if it is continued by the Railway Company.

One reason I think why it has not been more generally used is that an impression has gone abroad that it was only an experiment on the part of the railway company, and that it might be changed at any time and that it was not worth while to have watches and clocks changed.

When it is thoroughly understood that the twenty-four hour system is to be permanently used on the railway it will quickly come into general use.

I am decidedly in favor of the twenty-four hour system for operating the railway and think it would be a great mistake to go back to the old system.

Yours truly,

J. MURRAY.

No. 31.

From the Mayor of Port Arthur.

MAYOR'S OFFICE.

PORT ARTHUR, December 30th, 1886.

WM. WHYTE, Esq.,

General Superintendent C. P. R.

Dear Sir,

The question of the twenty-four hour system has been brought to my notice, and also the query whether it would be advisable to have it in operation both east and west of Port Arthur? I think it most desirable to have an uniform time, and think the twenty-four hour system should be put in operation throughout the whole line of the Canadian Pacific Railway.

I remain, yours truly,

GEO. H. MACDONNELL,

Mayor.

No. 32.

From the Mayor of Brandon.

CITY CLERK'S OFFICE.

CITY OF BRANDON, MAN., November 23rd, 1886.

My Dear Sir,

Your Agent, Mr. Peters, has asked me to give my opinion of the twenty-four hour system now in vogue on your line.

As it has not, as yet, been adopted by the general public here as a standard system, I am hardly able to give a decided answer as to its success. For railway purposes, I should imagine it is a great improvement on the old system.

I have no doubt as soon as the public can fully appreciate its advantages, and are thoroughly initiated, it will be wondered how we managed to hold on to such an "old time" idea as long as we did.

I am, yours very truly,

JAS. A. SMART,

Mayor.

W. WHYTE, Esq.,

General Superintendent C. P. R.

No. 33.

From the Mayor of Winnipeg.

MAYOR'S OFFICE.

CITY OF WINNIPEG, 17th November, 1886.

W. WHYTE, Esq.,

General Superintendent C. P. R., Winnipeg.

Dear Sir,

Answering your favor of 15th inst. I desire to say that I am very favorably impressed indeed with the twenty-four hour system, and trust that in a short time it will prevail on the whole continent.

Yours truly,

H. S. WESTBROOK,

Mayor.

No. 34.

From the President of the Manitoban Company.

WINNIPEG, Man., January 3rd, 1887.

Dear Mr. White,

In reference to your enquiry as to the twenty-four hour time system I beg to say that when the system first came into force it was adopted in the *Manitoban*, (newspaper) that it has been kept up ever since and that no complaints have been received from the public respecting its use.

My personal experience in travelling is that the twenty-four hour system is a great improvement on the old plan of a.m. and p.m. It is especially convenient in a long journey such as along the main line of the C.P.R. and I found the time table on the eastern division where a.m. and p.m. are used much more difficult to keep track of than the one on the western division where the new system is in force.

No doubt the public generally have not become very familiar with the new system, especially in the country districts remote from railways. When the monetary system of Canada was changed to the decimal system, considerable difficulty was undoubtedly experienced at first. The alteration from local time to standard time was another advance and I think it is only a question of a few months when the twenty-four hour system will be as popular as the other two changes I have mentioned. Much can be done to educate the public in the matter and I would especially suggest that in all public buildings, offices, schools, etc., the clocks should be supplied with the changing dial like the clock in your office which shifts at noon so that during the afternoon, only the numbers from 13 on to 24 are visible. The press might assist very much in making the new system popular, and I think you would find it a good plan to have diagrams of the new dials made with explanations supplied in stereotyped form to the country papers, which would undoubtedly do much to explain the working of the new system.

I hope to see the system extended very soon in Eastern Canada and the United States, feeling sure that any prejudice there may now be against it will soon disappear, and that ere long people will wonder that the improvement did not come sooner.

Yours truly,

ACTON BURROWS.

W. WHYTE, Esq.,

President.

General Superintendent C. P. R., Winnipeg.

No. 35.

MANITOBA & NORTH-WESTERN RAILWAY COMPANY
OF CANADA.

OFFICE OF THE GENERAL SUPERINTENDENT.

PORTAGE LA PRAIRIE, November 20th, 1886.

Dear Mr. Whyte,

At the time the twenty-four hour system was put in force on your Western Division I decided to await the result of the experiment before adopting it ourselves; I was not, therefore, in a position to report directly on the working of it.

Since your letter was received, however, I have made careful inquiries of all our trainmen and also our agents, and I find that they are unanimous in its favor; and, moreover, the agents report that the public at our stations would undoubtedly use it if this railroad company adopt it, and if you decide to continue we shall certainly put it in force on our road.

I shall be glad to hear from you whether you intend to make the system as it now stands permanent or not.

Yours truly,

W. R. BAKER,

Gen. Superintendent.

NOTE.—Since the date of the above letter the twenty-four hour system has been adopted on the Manitoba & North-Western Railway with the general acceptance of all concerned.

No. 36.

THE NORTH-WESTERN COAL & NAVIGATION COMPANY.

LETHBRIDGE, December 1st, 1886.

W. WHYTE, Esq.,

General Superintendent, C. P. R., Winnipeg.

Dear Sir,

In reply to your letter of the 15th ult., with reference to the work-

ing of the twenty-four hour system, I now beg to enclose letters bearing on the subject written by:

J. Baily, Superintendent, Galt R.R.

T. D. Kevin, Train Dispatcher.

A. Barber, Station Agent, Lethbridge.

For my own part I may say that the system is an unqualified success for business purposes, and that it is fast coming into general use in this district.

Yours faithfully,

E. T. GALT,
Manager.

No. 37.

THE NORTH-WESTERN COAL & NAVIGATION COMPANY.

SUPERINTENDENT'S OFFICE.

LETHBRIDGE, November 25th, 1886.

E. T. GALT, Esq.,
General Manager.

Dear Sir,

With reference to your conversation about the usefulness of the twenty-four hour system adopted by this company on the 8th August, last, I beg to state that I consider it has filled a long-felt want amongst railway men, and is much superior in every way to the old a.m. and p.m. method of dividing the twenty-four hours. The general public are decidedly in favor of it, as it enables them fully to comprehend the largest and most complicated time-table without any trouble; and I feel certain that wherever it is used it cannot fail to give the greatest satisfaction.

J. BAILY,
Superintendent.

No. 38.

THE NORTH-WESTERN COAL & NAVIGATION COMPANY.

LETHBRIDGE, N. W. T., November 18th, 1886.

J. BAILY, Esq.,

Superintendent.

Dear Sir,

In reference to the twenty-four hour system, I would state that in my opinion it is, without doubt, the best ever introduced.

I find in its practical working that the conductors and trainmen express their entire satisfaction with it.

I consider that it is a vast improvement on the old method, and certainly in every way is more convenient and handier in train dispatching.

Yours truly,

T. D. KEVIN,

Train Dispatcher.

No. 39.

THE CANADIAN PACIFIC RAILWAY COMPANY.

OFFICE OF THE ASSISTANT GENERAL MANAGER.

MONTREAL, 7th January, 1887.

The 24 hour system has been in effect on our Western and Pacific Divisions from the 1st July last year until the present time and it has given universal satisfaction.

I must confess that I hardly believed the system would meet with favor from the men, when it was first proposed to try the experiment, but am quite satisfied now that not only our officers and employees but business people living in the towns along the line prefer it to the old system.

The element of increased simplicity which it introduces into the train time cards, is no doubt conducive to safety, and will bring it into effect on all the railroads on the continent.

THOS. G. SHAUGHNESSY,

Assistant General Manager.

No. 40.

Letter from the Hon. J. Norquay, Premier, Province of Manitoba.

EXECUTIVE COUNCIL.

WINNIPEG, January 9th, 1887.

My dear Mr. WHYTE,

In reply to yours of the 16th inst., asking me to give my views in reference to the adoption of the twenty-four hour system, I may say that in my opinion it is on its merits an improvement upon the old system. It appears a little awkward at first, but the experience of all that I have talked to on the subject is the same as my own: That it prevents many mistakes that arose out of the a. m. and p. m. system, and I should think that it would be a great improvement if adopted on all lines of railway.

I remain yours truly,

J. NORQUAY.

WM. WHYTE, Esq.,

General Superintendent Canadian Pacific Railway.

No. 41.

From the Honorable J. C. Aikins, Lieutenant Governor, the Province of Manitoba.

GOVERNMENT HOUSE.

WINNIPEG, January 10th, 1887.

Dear Sir,

Your letter referring to the twenty-four hour system has been received. It gives me pleasure to say in reply that the introduction in Manitoba of that system has unquestionably been a great advantage in railway matters.

Persons here are now much less apt to make mistakes, as to the time of arrival and departure of trains.

I believe the people of Manitoba are not inclined to allow prejudice to prevent their abandonment of an old system if a new and bet-

ter one is proposed, and, as far as I have been able to ascertain, our people acknowledge that, for general purposes, the twenty-four hour system is an improvement.

They have partially adopted it, and, I am inclined to think, would be using it generally were it not for the expense of changing the dials of the old time-pieces or procuring new ones.

Yours very truly,

(Signed.) J. C. AIKINS.

WM. WHYTE, Esq.,

General Superintendent C. P. R., Winnipeg, Man.

No. 42.

CANADIAN GOVERNMENT RAILWAYS.

OFFICE OF THE CHIEF ENGINEER AND GENERAL MANAGER.

OTTAWA, January 15th, 1887.

MY DEAR SIR,—I am very much pleased to learn that the twenty-four (24) hour system of time, introduced upon the Western Division of the Canadian Pacific Railway, is giving great satisfaction, and that the officers of the Company, after testing it a full season, strongly favour it, and advocate its extension to other parts of the road. Its general adoption throughout the country will, I am satisfied, be a great advantage to the operations of the railways, and will save much inconvenience and annoyance to which the travelling public are subjected under the old system, by avoiding mistakes which frequently occur as to the time of the departure of trains. For my own part I shall be glad to see the 24-hour system extended to every railway upon this continent, and I shall exert every effort to induce the Government to permit it to be put in operation upon the Government Railways at an early date. Once introduced, and the public become accustomed to the change, I believe it will meet with great favour.

Yours very truly,

COLLINGWOOD SCHREIBER,

Chief Engineer and General Manager.

SANDFORD FLEMING, C.M.G., C.E.,

Ottawa.

No. 43.

Resolutions Adopted at the Annual Meeting of the AMERICAN SOCIETY OF CIVIL ENGINEERS.

NEW YORK, 19th January, 1887.

FIRST RESOLUTION.

That the Report of the Special Committee on Standard Time, now submitted, be accepted, and the Committee continued.

SECOND RESOLUTION.

That a copy of the Report and accompanying letters be transmitted to the Secretaries of the several Railway Time Conventions, with the request that they take into consideration the propriety and expediency of adopting the twenty-four hour system on all the railways in North America at the next change of time-tables; and that the Board of Direction of this Society be authorized, if they consider it expedient, to send copies to the leading railway officials of the country.

THIRD RESOLUTION.

That the Special Committee be instructed and authorized, with the approval of the Board of Direction, to take such further action as may be deemed expedient to advance this important movement.

FOURTH RESOLUTION.

It is the sense of this Society that it is desirable, for the purpose of familiarizing the public with the change involved in the introduction of the twenty-four hour system, that the Mayors and Corporations of the principal cities in the United States, Canada and Mexico, have the dials of public clocks adapted to the new notation; also that it is desirable that the Post Office Departments of the United States, Canada and Mexico, introduce the twenty-four hour system of notation in the Post Offices of the country, and in such publications on postal affairs as refer to the hours of the day.

No. 44.

The Old Usage and the New Notation.

NOTE.

On the movement for abolishing A.M. and P.M. in our daily time-reckoning, and adopting a simple notation of twenty-four hours, reckoned from mid-night to mid-night.

Whoever examines the question will express profound surprise that the day was ever divided in two parts and each part subdivided into twelve hours, one set of hours distinguished as *ante meridian*, the other set as *post meridian*.

The practice of so dividing and subdividing the day is very old, and centuries back it doubtless answered all the purposes of man. The conditions of the human race in the more advanced communities are, however, greatly changed, and the old practice of halving the day is becoming every year more and more inconvenient, and will soon become intolerable. Beyond its claim to antiquity, the custom has nothing whatever to recommend it.

The inconveniences resulting from this old custom are well known to many, but they have generally been looked upon as unavoidable, and consequently, have been philosophically and silently endured. Such evils are met by all who have anything to do with railways, and in this country, where all travel more or less by railway, there are few who have not experienced them? Is there in fact, one person who, at some time or other, has not been baffled in his efforts to solve the intricacies of railway time-tables? Is there a single individual who cannot refer to frequent mistakes and disappointments to himself and others, springing directly from this cause? Is there an experienced railway man who cannot trace some accident to a misprint or mistake of A.M. for P.M., or P.M. for A.M.? It is held that there is no necessity for dividing the day into halves; that the distinction made, between the 12 hours before noon and the 12 hours which follow noon, is awkward and inconvenient, and that the expressions *ante meridian* and *post meridian*, or their contractions, A.M. and P.M., should be abolished, and a more simple notation substituted.

It is difficult to understand how the 12 hour division crept into use. It may have been at a period when common education was at a low ebb, and when in dealing with marketable commodities, it became expedient to reduce arithmetical quantities to dozens. Such a practice

is no longer necessary, as most people nowadays can count higher than twelve. The division of the day in accordance with this old custom is now indefensible, and not a single reason can be given why the same numbers should do duty twice on our clocks and watches, to indicate, as they now do, two distinct and separate hours.

The division of the day into halves at noon, besides being unnecessary and inconvenient, is unnatural. The only divisions of the day indicated by nature are those of daylight and darkness. Had those portions of time been subdivided into separate sets of hours, making 6 o'clock come at noon, instead of 12 o'clock, as in scriptural times, and in the time of the Greeks and Romans, it would have been at least in harmony with nature, and, in some respects, more rational than the present usage.

The more the subject is considered, the more it will be found that the traditional usage which we follow has no advantage, while it has many disadvantages. Every argument points to the expediency of abandoning the halving of the day at noon, and the adoption of a consecutive numbering of the hours in a single series of twenty-four from midnight to midnight. The present system is an impediment to general intercourse, and the removal of all such impediments is of such great and increasing importance as to outweigh and overrule every consideration of tradition or habit, however ancient and long continued.

It has been urged against the proposed change that the clocks and watches that exist would be rendered useless by its general adoption. This would, no doubt, be a serious objection, if it held good. It is not, however, a valid objection, as it is an easy matter to utilize every time-keeper now in use. This can be effected by a slight alteration in the dial. The alteration can be effected at a cost too trifling to be considered. It has been said that any watch can thus be altered so as to suit the twenty-four o'clock notation at a cost not exceeding the price of a single postage stamp.

The new notation has been thoroughly tried, since mid-summer, 1886, on the Canadian Pacific Railway. Clocks and watches were adapted to the change simply by placing on the old dials the new numbers of the afternoon hours. The method of adapting all time keepers to the new system is described in document No. 2 of this pamphlet, being the circular and directions issued to employees of the Canadian Pacific Railway, June 10th, 1886. This extremely inexpensive method has answered every purpose, and will continue to do so until watchmakers supply other dials to suit the taste of each individual. The change was effected without the least confusion. Employees of the railway were intelligent enough to understand the new system at once, and very soon the public became familiar with it. So well satisfied are all with the change that none express any desire to revert to the old practise.

The first great practical step in time reform was effected on the 18th November, 1883, when trains commenced to run throughout the

United States and Canada by Hour Standards. The whole continent has practically accepted that step so wisely and promptly taken by the railway authorities, and the man who would now seriously propose to return to the state of things which existed previous to the date mentioned, would be laughed at. The second practical step in time-reform is the general adoption of the twenty-four hour notation; this second step is of equal importance to the first and can be effected with equal ease. When the twenty-four hour notation comes into common use, every one will wonder that the old usage was so long endured.

The remarkable simplicity, perspicuity and utility of the plan of time-reckoning proposed is fully appreciated by sensible men. A bill authorizing the new notation as a legal standard has already been introduced in the Legislature of the State of New York (11th February, 1887). The measure comprises the following sections, viz.:

“SECTION 1.—The hours of the day, from midnight to midnight, may be designated by consecutive numbers from zero to twenty-four, and the hour of midnight may be designated either as twenty-four o'clock of the day then ending or as zero o'clock of the day then beginning.

“SECTION 2.—This Act shall take effect immediately.”

Scientific societies in Great Britain, the United States and Canada are beginning to adopt the twenty-four hour notation in all their transactions. In calling meetings or issuing invitations, it has been recommended, until the public become familiarized with the change, to give the old notation along with the new, thus: “The meeting will be held at 19:45 (7.45 o'clock P.M. old style).” This would not only obviate any doubt during the period of transition, which would be brief, but it would more speedily educate the mind to the new numbers of the afternoon hours. It is suggested that a COLON, or two vertical dots between the hours and minutes (thus, 19:45 or 17:08), will be a sufficient distinctive mark for all ordinary purposes. A colon so placed will at once denote *time* and separate the minutes from the seconds in the same manner as a single dot denotes *decimals* and separates the whole numbers from parts of numbers. It is held that under ordinary circumstances there will be no necessity for adding the word “o'clock,” or “hours,” or “minutes;” a colon placed between numerals will come to have a clear, distinctive signification. It will unmistakably denote *time* just as % denotes *per cent.*, and as the sign \$ stands for *dollars*, and as £ s. d. are the symbols for the *pounds shillings and pence currency*.

No. 45.

RAILWAY SUPERINTENDENTS, MANAGERS, PRESIDENTS *and others from whom an expression of opinion has been received favorable to the general adoption of the 24 o'clock system throughout North America. There are many others favorable who have not been heard from in writing. The following have, however, given unqualified expression to their opinions and are ready at the proper moment to adopt the change.*

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Adirondack Ry.....	C. E. Durkee, Superintendent...	Saratoga Springs, N. Y.
Allegheny Valley Ry.	David McCargo, Gen. Sup't....	Pittsburgh, Pa.
Atchison, Topeka and Santa Fe Ry. and South Kansas Ry.....	A. A. Robinson, Gen. Manager..	Topeka, Kansas.
Atlantic Div. East Tenn., Virginia and Georgia Ry.....	J. W. Fry, Superintendent.....	Atlanta, Ga.
Atlantic and North Carolina Ry.....	W. Dunn, Superintendent.....	Newberne, N. C.
Bellaire, Zanesville and Cincinnati Ry.....	W. R. Crompton, Gen. Manager.	Woodsfield, Ohio
Belvidere Div. Penna. Ry.....	J. A. Andrews, Superintendent..	Lambertville, N. J.
Bennington and Rutland Ry.....	F. C. White, Gen. Supt.....	Bennington, Vt.
Boston, Barre and Gardner Ry.....	H. H. Marshall, Supt. and Traffic Manager.....	Worcester, Mass.
Boston, Hoosac Tunnel and Western Ry.	H. L. Morrill, Gen. Manager ...	Saratoga, N.Y.
Boston, Hoosac Tunnel and Western Ry.	Chas. H. Cory, Supt.....	Mechanicville, N.Y.
Boston and Lowell Ry..	C. S. Metten, Gen. Supt.....	Boston, Mass.
Boston and Providence Ry.....	Albert A. Folsom, Supt	Boston, Mass.
Boston, Revere Beach and Lynn Ry.....	C. A. Hammond, Supt.....	350 Atlantic ave., Boston, Mass.
Brooklyn, Bath and Coney Island Ry.....	Geo. A. Gunther, Gen. Manager.	27th st. and 5th ave., Brooklyn, N. Y.
Brunswick and Western Ry.....	H. S. Morse, Gen. Manager ...	Brunswick, Ga.
Buffalo, New York and Phila. R. R.	Geo. S. Gatchell, Gen. Supt	Buffalo, N. Y.
California Southern R.R.	J. N. Victor, Supt.....	National City, Cal.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Canadian Government Railways, Intercolonial System, Prince Edward Island System.	Collingwood Schreiber, Chief Engineer and Gen. Manager.	Ottawa Canada.
Canadian Pacific Ry. . .	W. C. VanHorne, Vice-President	Montreal, Canada.
Canadian Pacific Ry. . .	T. G. Shaughnessy, Asst. Gen. Man.	Montreal, Canada.
Canadian Pacific Ry. . .	W. Whyte, Gen. Supt.	Winnipeg, Canada.
Canadian Pacific Ry. . .	Henry Beatty, Manager Steamship Lines	Toronto, Canada.
Cape Fear and Yadkin Valley Ry.	J. S. Morrison, Chief Engineer and Gen. Supt.	Fayetteville, N. C.
Central Iowa Ry.	D. P. Phelps, Asst. Supt.	Monmouth, Ill.
Central Road and Banking Co. of Georgia. . .	William Rogers, Gen. Supt.	Savannah, Ga.
Central Vermont R. R. . .	J. W. Hobart, Gen. Man.	St. Albans, Vt.
Central Vermont R. R. . .	C. A. Converse, Asst. Supt. Local Freight Traffic	St. Albans, Vt.
Chattoroi Ry.	F. H. Oliphant, Gen. Man.	Ashland, Ky.
Chesapeake, Ohio and S. W. R. R.	J. L. Frazer, Supt.	Louisville, Ky.
Chicago, Fairchild and Eau Claire R. R. . . .	G. A. Foster, Sec'y and Asst. Gen. Manager.	Fairchild, Wis.
Chicago and Grand Trunk Ry.	W. H. Pettibone, Supt.	Battle Creek, Mich.
Chicago, Rock Island and Pacific Ry.	A. Kimball, Vice President and Gen. Manager.	Chicago, Ill.
Chicago, Rock Island and Pacific Ry.	H. T. Royce, Asst. Gen. Supt.	Davenport, Iowa.
Chippewa Valley and Chicago and West Michigan Ry.	A. M. Nichols, Gen. Supt.	Grand Rapids, Mich.
Wabasha Div. Chicago, Milwaukee & St. Paul Ry.	J. H. Lakey, Supt.	Wabasha, Minn.
Cincinnati, Ham. & Dayton Ry.	C. C. Waite, Vice-President.	Cincinnati, Ohio.
Cincinnati, New Orleans and Texas Pacific and Associate Roads	R. Carroll, Gen. Supt.	Cincinnati, Ohio.
Cincinnati, Van Wert and Mich. Ry.	Everett Garrison, Gen. Manager and Chief Engineer	Greenville, Ohio.
Cincinnati, Washington and Balto. Ry.	J. H. Stewart, Gen. Man.	Cincinnati, Ohio.
Columbus, Hocking Valley and Toledo Ry. . .	G. R. Carr, Gen. Supt.	Columbus, Ohio.
Columbus and Western Ry.	E. A. Flewellen, Gen. Man.	Opelika, Ala.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Conotton Valley Ry....	Samuel Briggs, Receiver and Gen. Manager.....	Cleveland, Ohio.
Coudersport and Port Allegheny Ry.....	B. A. McClure, Gen. Supt.....	Coudersport, Pa.
Denver and Rio Grande Ry.*.....	Cole Lydon,, Div. Supt. (2d Div.)	Alamosa, Col.
Denver, Utah and Pacific Ry.....	L. M. Fonts, Supt.....	Denver, Col.
Detroit, Mackinac and Marquette Ry.....	D. McCool, Gen. Supt.....	Marquette, Mich.
Eastern Div. Flint and Pere Marquette Ry...	William F. Potter, Supt.....	East Saginaw, Mich.
East Tennessee, Virginia and Georgia Ry.....	Henry Fink, Vice-President and Gen. Manager, and Gen. Manager Memphis and Charleston..	Knoxville, Tenn.
East and West Ry. of Alabama.....	John Postell, Gen. Manager....	Cedartown, Ala.
Eureka and Palisade Ry.	B. Gilman, Gen. Supt.....	Eureka, Nev.
Eureka Springs Ry.....	Powell Clayton, Vice-President and Gen. Manager.....	Eureka Springs, Ark.
Flint and Pere Marquette Ry.....	D. Edwards, Asst. Gen. Manager	East Saginaw, Mich.
Flint and Pere Marquette Ry.....	Geo. M. Brown, Road Master...	East Saginaw, Mich.
Fort Worth and Denver City Ry.....	C. L. Frost, Supt.....	Fort Worth, Tex.
Galveston, Sabine and St. Louis Ry.....	Brad Barner, First Vice-President and Gen. Manager.....	Longview, Tex.
Georgia Pacific Ry.....	I. W. Sage, Gen. Supt.....	Birmingham, Ala.
Grand Southern Ry....	F. W. Holt, Supt. and Engineer.	St. George, N. B., Can- [ada.
Grand Trunk Railway of Canada.....	Wm. Wainwright, Asst. Manager.	Montreal, Canada.
Grand Trunk Railway of Canada.....	J. Stephenson, Supt.....	Montreal, Canada.
Green Bay, Winona and St. Paul Ry.....	Timothy Case, Gen. Supt.....	Green Bay, Wis.
Gulf, Western Texas and Pacific Ry.....	M. D. Monserrate, President and Supt.....	Cuero, Texas.
Hartford and Connecticut W. Ry.....	John F. Jones, Gen. Supt.....	Hartford, Conn.
Houston, East and West Texas Ry.....	Wm. H. Wentworth, Asst. Gen. Manager.....	Houston, Texas.
Houston and Texas Central Ry.....	J. Waldo, Vice-President.....	Houston, Texas.
Houston and Texas Central Ry.....	A. H. Swanson, Gen. Transportation Manager.....	Houston, Texas.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Houston and Texas Central Ry.....	M. G. Howe, Engineer and Supt. First Div.....	Houston, Texas.
Houston and Texas Central Ry.....	Donald Allen, Engineer and Supt, Third Div.....	Houston, Texas.
Illinois Central Ry.....	E. T. Jeffery, Gen. Supt.	Chicago, Ill.
Illinois Div. Chicago, Rock Island and Pacific Ry.....	R. H. Chamberlin, Supt.....	Chicago, Ill.
Indiana, Illinois and Iowa Ry.....	T. P. Shonts, Gen Supt	Kankakee, Ill.
Intercolonial Ry.....	D. Pottinger, Chief Supt.....	Moncton, N. B., Can.
Intercolonial Ry.....	P. S. Archibald, Chief Engineer.	Moncton, N. B., Can.
International Ry.....	D. E. McFee, Supt.....	Sherbrooke, Can.
International Div. Missouri Pacific Ry.....	W. H. Boyd, Master of Transportation.....	Palestine, Texas.
Kalamazoo Div. Lake Shore and Michigan Southern Ry.....	M. E. Wattles, Supt.....	Kalamazoo, Mich.
Kansas City, St. Joseph and Council Bluffs and Hannibal and St. Joseph Roads.....	J. F. Barnard, Gen. Man.	St. Joseph, Mo.
Jacksonville Southeastern Ry.....	E. S. Greenleaf, Supt.....	Jacksonville, Ill.
Jeffersonville, Madison and Indianapolis Ry..	E. W. McKenna, Supt.....	Louisville, Ky.
Kansas Div. Union Pacific Ry.....	S. T. Smith, Gen. Supt	Kansas City, Mo.
Knox and Lincoln Ry..	C. A. Coombs, Supt	Bath, Me.
Lehigh Valley Ry	H. Stanley Goodwin, Gen. Supt.	Bethlehem, Pa.
Long Island Ry.,.....	C. E. Topping, Supt. Telegraph.	Long Island City, N.Y.
Louisville, Evansville and St. Louis Ry.....	C. A. Darlton, Supt.....	Louisville, Ky.
Louisville, New Albany and Chicago Ry.....	Theo. D. Dunn, Gen. Supt.....	Chicago, Ill.
Mahony and Susq. Div. P. and R. Ry.....	J. H. Olhausen, Supt	Pottsville, Pa.
Memphis and Little Rock Ry.....	Rudolph Fink, Receiver and Gen. Manager.....	Little Rock, Ark.
Mexican National Ry...	C. A. Merriam, Supt.	Laredo, Texas.
Middle Div. Penna. Ry.	O. E. McClellan, Supt.	Harrisburg, Pa.
Milford, Franklin and Providence and Hopkington Ry.....	E. T. Logee, Gen. Supt	Milford, Mass.
Milwaukee, Lake Shore and Western Ry.	H. G. H. Reed, Gen. Supt	Milwaukee, Wis.
Milwaukee and Northern Ry.....	C. F. Dutton, Gen. Supt.....	Milwaukee, Wis.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Morgan's Louisiana and Texas Ry.	J. Kruttschmitt, Engineer & Supt.	New Orleans, La.
Missouri Div. Northern Pacific Ry.	F. Greene, Asst. Supt.	Mandan, Dak.
Nashville & Florence Ry. Natchez, Jackson and Columbia Ry.	J. T. Craik, Chief Engineer & Supt.	Columbia, Tenn.
Nevada Central Ry.	E. D. Frost, Gen. Supt.	Natchez, Miss.
Newport and Wickford Ry. and Steamboat Co.	F. W. Dunn, Gen. Supt.	Battle Mountain, Nev.
New Haven and Northampton Ry.	Theo. Warren, Supt.	Newport, R. I.
New York, Chicago and St. Louis Ry.	S. B. Opdyke, jr., Supt.	New Haven, Conn.
New York City and Northern Ry.	G. H. Kimball, Supt.	Cleveland, Ohio.
New York, Lake Erie and Western Ry.	F. S. Gannon, Gen. Supt.	High Bridge, N. Y.
New York, Lake Erie and Western Ry., operating New York, Penna. and Ohio Ry..	E. S. Bowen, Vice-President	New York City.
New York, Ontario and Western Ry.	S. M. Felton, Jr., Asst. to Pres't.	Cleveland, Ohio.
New York, Ontario and Western Ry.	J. E. Childs, Gen. Supt.	New York.
New York, Pittsburgh and Chicago Ry.	C. W. Laupher, Div. Supt.	Norwich, N. Y.
New York, Providence and Boston Ry.	G. W. Dixon, Supt.	New Galilee, Pa.
New York and Sea Beach Ry.	J. B. Gardiner, Supt.	Providence, R. I.
New York and New England Ry.	Wm. O. McDowell, Vice-President and Gen. Manager.	New York City.
New York, West Shore and Buffalo Ry.	J. W. Perkins, Asst. to Receiver.	Boston, Mass.
New Orleans and Selma Ry.	J. D. Layug, Gen. Man.	New York.
Norfolk and Western Ry. and Shenandoah Valley Ry.	Norman Webb, Receiver.	Selma, Ala.
Northern Ry. of Canada.	Charles Blackwell, Supt. of Motive Power.	Roanoke, Va.
Northern Div. Chicago, Milwaukee and St. Paul Ry.	Samuel Barker, Gen. Man.	Toronto, Can.
Northern Div. Southern Pacific Ry.	L. B. Rock, Supt.	Milwaukee, Wis.
Northern Pacific Ry.	A. C. Bassett, Supt.	San Francisco.
Northern Pacific Ry.	Robert Harris, President.	New York.
Northern Pacific Ry.	T. B. Oakes, Vice-President and Gen. Manager.	St. Paul, Minn.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Ohio Central Ry.....	J. E. Martin, Receiver.....	Toledo, Ohio.
Old Colony Ry.....	J. R. Kendrick, Gen. Manager..	Boston, Mass.
Oregon Ry. and Nav.Co.	H. S. Rowe, Supt.....	Portland, Or.
Oswego & Syracuse Div. Delaware, Lackawanna and Western Ry.....	W. B. Phelps, Supt.....	Oswego, N. Y.
Pennsylvania Ry.....	R. P. Snowden, Asst. Engineer, Maintenance of Way.....	Camden, N. J.
Pennsylvania R.R. Div. P. Ry.....	M. W. Thomason, Engineer Main- tenance of Way.....	Altoona, Pa.
Pensacola & Atlantic Ry.	W. D. Chipley, Vice-President and Gen. Supt.....	Pensacola, Fla.
Peoria, Decatur and Wansville Ry.....	G. L. Bradbury, Vice-President..	Peoria, Ill.
Philadelphia and Read- ing Ry.....	W. Lorenz, Chief Engineer.....	Philadelphia, Pa.
Pontiac, Oxford and Port Austin Ry.....	James Houston, Gen. Supt.....	Pontiac, Mich.
Portland & Ogdensb'g Ry.	J. Hamilton, Supt.....	Portland, Me.
Providence and Spring- field Ry.....	Wm. Tinkham, President.....	Providence, R. I.
Providence and Worces- ter Ry.....	W. E. Chamberlain, Supt.....	Providence, R. I.
Providence, Warren and Bristol Ry.....	W. Stone, Supt. and Engineer..	Providence, R. I.
Pullman Palace Car Co.	George F. Browne, Gen. Supt...	Chicago, Ill.
Quebec & L. St. John Ry.	J. G. Scott, Sec'y and Manager..	Quebec, Canada.
Richmond and Alle- gheny Ry.....	Decatur Axtell, Receiver and Man- ager.....	Richmond, Va.
Richmond, Fredericksb'g and Potomac Ry....	E. T. D. Myers, Gen. Supt.....	Richmond, Va.
Richmond and Peters- burg Ry.....	J. R. Kenly, Supt.....	Richmond, Va.
Rochester Div. Buffalo, New York and Phila. Ry.....	J. W. Watson, Supt.....	Olean, N. Y.
Rochester and Pittsburgh Ry.....	Jas. T. Gardner, Gen. Supt.....	Buffalo, N. Y.
Rogersville and Jefferson Ry.....	Chas. M. Lentz, Supt.....	Bull's Gap, Tenn.
San Antonio Div. Gal- veston, Harrisburg and San Antonio Ry.....	W. G. Van Vleck, Supt.....	San Antonio, Tex.
San Pete Valley Ry....	S. Bamberger, Managing Director.	Salt Lake City, Utah.
Sea Board & Roanoke Ry.	E. Ghio, Supt. Transportation...	Portsmouth, Va.
Shenango and Allegheny Ry.....	J. T. Blair, Gen. Manager.....	Greenville, Pa.
South Carolina Ry....	John B. Peck, Gen. Manager....	Charleston, S. C.
Southern Div. Illinois Central Ry.....	C. M. Sheaffer, Supt.....	New Orleans, La.

RAILWAY.	OFFICIAL NAME AND TITLE.	ADDRESS.
Southern Minnesota Div. Chicago, Milwaukee and St. Paul Ry.....	F. D. Underwood, Supt.....	La Crosse, Wis.
St. Joseph & Desloge Ry.	T. T. Onderdonk, Gen. Supt..	Bonne Terre, Mo.
St. Johns and Lake Eus- tis Ry.....	W. J. Jarvis, Supt.....	Fort Mason, Fla.
St. Louis, Alton and Terre Haute Ry. (St. Louis & Cairo Short Line)..	Geo. W. Parker, Gen. Manager	St. Louis, Mo.
St. Louis and Cairo Ry.	C. Hamilton, Gen. Supt.....	St. Louis, Mo.
St. Louis Div. Louisville and Nashville Ry....	Chas. O. Parker, Supt.....	Evansville, Ind.
St. Louis, Des Moines and Northern Ry....	C. F. Meek, Supt.....	Des Moines, Iowa.
St. Louis, Fort Scott & Wichita Ry.....	I. W. Miller, Vice-President....	Fort Scott, Kansas.
St. Louis, Fort Scott & Wichita Ry.....	W. H. Norris, Train Master....	Fort Scott, Kansas.
Stony Creek Ry.....	Geo. B. Boggs, Supt. & Engineer	Norristown, Pa.
St. Paul, Minneapolis & Manitoba Ry.....	James J. Hill, President.....	St. Paul, Minn.
St. Paul, Minneapolis & Manitoba Ry.....	H. C. Ives, Gen. Man.'s Asst...	St. Paul, Minn.
Tennessee Coal & Iron Ry	A. M. Shook, Gen. Manager....	Tracy City, Tenn.
Tioga Ry.....	R. Du Puy, Supt. and Engineer	Blossburg, Pa.
Toledo, Ann Arbor and North Michigan Ry..	H. W. Ashley, Gen. Supt.....	Toledo, Ohio.
Truckee Div. Central Pacific Ry.....	J. H. White, Supt.....	Wadsworth, Neb.
Tyrone Div. Penn Ry..	S. S. Blair, Supt.....	Tyrone, Pa.
Virginia & Truckee Ry..	H. M. Yerrington, Vice-President and Gen. Supt.....	Carson City, Nev.
Warren and Farnsworth Valley Ry.....	A. D. Wood, Gen. Manager....	Warren, Pa.
West Virginia, Central and Pittsburgh Ry....	W. E. Porter, Gen. Supt.....	Piedmont, W. Va.
Worcester, Nashua and Rochester Ry.....	C. S. Turner, Pres. and G. Man.	Worcester, Mass.
York & Peachbottom Ry	S. M. Manifold, Supt. and Engi- neer.....	York, Pa.
Williamsport and North Branch Ry.....	Benj. G. Welch, President and Gen. Manager.....	Hughesville, Pa.

The 24 O'Clock System.

First list, published in 1884, of Engineers, Railway Presidents, Traffic Managers, Scientists and other prominent persons, who, in their replies to questions issued in 1882 by the Standard Time Committee, gave their unqualified preference for a division of the day into a single series of hours numbered from one to twenty-four (1 to 24).

In addition to this list a number of gentlemen expressed themselves in favor of the 24 o'clock system for Railway Time Tables, but were in doubt as to the possibility of bringing it into common use for all purposes.

Only eight (8) per cent. of all heard from expressed themselves as unfavorable to the 24 o'clock notation.

The names with an asterisk (*) are members of the American Society of Civil Engineers.

NAME.	OFFICIAL TITLE.	ADDRESS.
W.J. McAlpine, M.I.C.E.*	Past Pres. Am. Soc. Civil Engineer	Bay Ridge, N. Y.
M. J. Becket*	Chief Eng'r P. C. & St. L. R. W. Co	Pittsburg, Pa.
Martin W. Harrington.	Director Astron Observatory	Ann Arbor, Mich.
H. T. Eddy, Ph. D.	Prof. of Mathematics, Astron, and Civil Eng., Univer. of Cincinnati	Cincinnati, Ohio.
Robert Fletcher, Ph. D.*	Prof. of Civil Engineering	Hanover, N. H.
P. H. Philbrick*	Prof. C. E., State Univ. of Iowa	Iowa City, Iowa.
E. A. Doane*	Chief Eng., Rome W. & Og'gh. R.	Oswego, N. Y.
Henry B. Richardson*	Chief State Engineer	New Orleans, La.
H. Stanley Goodwin*	Asst. Gen. Super. Lehigh Valley R. R. Co.	Bethlehem, Penn.
Robert Briggs*		Philadelphia, Pa.
S. Spencer	3rd V. P., B. & O. R. R.	Baltimore, Md.
C. B. Comstock*	Lieut.-Colonel of Engineers. . . .	Detroit, Mich.
W. A. Doane*	Prin. Asst. Eng., R. W. & O. R. R.	Oswego, N. Y.
F. J. Lynch, M.I.C.E.	In charge Canad'n Pac. Ry. office	Ottawa, Canada.
James H. Rowan, C.E.	Ex-District Eng. C. P. Railway	Winnipeg, Man.
R. M. Harrod, C.E.*	Member Miss. River Commission	New Orleans.
C. S. Master*	Engineer in charge Western Div'n W. L. & G. R. R.	St. Louis, Mo.
James Hall, D.P.S.	Ex-Sheriff and Ex-M. P.	Peterboro, Ont.
W. A. Sweet*	President Sanderson St. Co.	Syracuse, N. Y.
Wm. T. Jennings	Rest. Engr. C.P.R.	Keewatin, Man.
M. G. Howe*	Eng. and Sup. H. & T. C. R. R.	Houston, Texas.
Robert H. Sayre	Sup. and Eng. Lehigh Val. R. R.	Bethlehem, Pa.
Robert Moore, C.E.*		St. Louis, Mo.
J. Foster Crowell*	Assistant Engineer, P. R. R. . . .	Pittsburg, Pa.

NAME.	OFFICIAL TITLE.	ADDRESS.
T. J. Potter.....	3rd Vice-Pres., etc., C.B. & O.R.R.	Chicago, Ill.
W. B. Smellie.....	Cons. Eng., Canadian Pac. R'y.	Montreal, Canada.
Julius W. Adams.....	Past Pres. Am. Soc'y Civil Eng.	Brooklyn, N. Y.
F. N. Gisborne.....	Super. Tel. Sig. Serv. Dom. Can.	Ottawa.
James H. Harlow*.....	Eng. Monongahela Navigat'n Co.	Pittsburg, Ohio.
Edward S. Philbrick*.....		12 W st., Boston, Mass.
Kivas Tully.....	Vice-Pres. Canadian Institute.....	Toronto.
T. H. Perry.....	Chief Eng., L. E. & W. R'd.....	Lafayette, Ind.
J. W. Putnam*.....	N. O. & M. R. R.....	New Orleans.
Charles H. Swan*.....	Mem. Am.M. Soc., Bnr, A.S.C.E.	Highlands, Boston.
Sir Charles Tupper.....	Min. of Railways and Canals.....	Ottawa, Canada.
Joseph P. Davis*.....	Vice-Pres. Am. Tel. Co.....	New York City.
P. S. Archibald.....	Chief Eng. Intercolonial Railway	Moncton, N. B.
H. E. Stevens*.....	U. S. Asst. Engineer.....	St. Paul, Minn.
B. S. Henning.....	Pres. Ohio Lo. R. W. Co.....	115 Broadway, N. Y.
J. Milton Titlow*.....	Principal Asst. Eng., City Hall..	Philadelphia, Pa.
C. A. Young.....	Prof. Astron'y, Col. of N. Jersey	Princeton, N. J.
Robert A. Shailer*.....	Asst. Supt. Edge Moore Iron W'ks	Wilmington, Del.
L. B. Archibald.....	Supt. Prince Edward Island R'y	Charlottetown.
E. P. Stearns*.....	Asst. Eng., Boston Imp. Sewerage	Atlanta, Mass.
C. S. Davidson.....	Sup. H. Div. N.Y., N.H & H.R.R.	Hartford, Conn.
Edward Maguire.....	Captain of Engineers, U. S. A..	
E. G. Ferris.....	Engineers D. and N. R. R.....	South Norwalk, Conn.
Collingwood Schreiber..	Chief Eng. and Gen. Man. Can. Government Railways.....	Ottawa, Canada.
Henry Gannett.....	Geographer of Census and of U. S. Geological Survey.....	Washington, D. C.
James P. Howley.....	Asst. Provincial Geologist.....	St. Johns, Nfld.
W. H. Wood.....	U. S. Assistant Engineer.....	St. Paul, Minn.
F. M. Towar.....	U. S. Assistant Engineer.....	St. Paul, Minn.
Julius J. Duraye.....	U. S. Assistant Engineer.....	St. Paul, Minn.
Thomas S. Sedgwick*..	Land Agt. At. & Pac. R'd Co..	Albuquerque, N. M.
George M. Dawson....	Asst. Director Geological Survey	Ottawa, Canada.
T. C. Mendenhall.....	Prof. Physics, Ohio State Univ.	Columbus, Ohio.
L. J. LeConte*.....	Res. E. g., Oakland Harbour..	Oakland, Cal.
Edward C. Pickering...	Director Harvard Col. Observat'y	Cambridge, Mass.
H. F. Royce.....	Division Superintendent.....	Des Moines, Iowa.
J. S. Sewall*.....		St. Paul, Minn.
W. B. Hazen.....	Brig. and Brevet Maj.-Gen., Chief Signal Officer, U. S. A.....	Washington.
G. Kennedy, M. A., L.L.D.	Law Clerk, Crown Land Depart	Toronto.
E. D. Ashe.....	Director Quebec Observatory...	Quebec.
Wilson Crosby*.....	C. E.....	Bangor, Me.
W. H. Pratt.....	Cor.-Sec. and Curator Acad. Nat. Science.....	Davenport, Iowa.
George S. Gatchell.....	Gen. Sup. B. N. Y. P. R. R.....	Buffalo, N. Y.
H. S. Pritchett.....	Prof. Astron'y and Director Ob- servatory, Wash. University..	St. Louis, Mo.
C. J. Ives.....	Gen. Supt. B. C. R. & W. R'y..	Cedar Rapids, Iowa.
Asa Horr, M.D.*.....	Pres. Iowa Inst. Science and Art	Dubuque, Iowa.
J. L. Gillespie.....	U. S. Assistant Engineer.....	St. Paul, Minn.
William P. Anderson...	Eng. to Marine Dept., in charge construction Can. Light Houses	Ottawa, Canada.

NAME.	OFFICIAL TITLE.	ADDRESS.
Rufus Ingalls	Quarter-Master General and Brevet Major-General, U.S.A.	Washington.
W. E. Jacobs		Salt Lake City.
Winslow Upton	Army Signal Office	Washington.
H. A. Howe	Prof. of Math. and Astron'y, Univ'y of Denver	Colorado.
D. R. Taylor	District Supt., N.P.R.R.	Mandan, D. T.
J. R. Eastman	Prof. Math., U.N.S., U.S.N., Observ'y	Washington.
James R. Barber	Railway Superintendent	Cobourg, Ont.
DeVolson Wood*	Prof. Math. and Mechan., Stevens' Institute, Tech.	Hoboken, N. J.
W. F. Ellice	Chief Eng. Connotton Val. R'y. Company	Canton, O.
Alex. Murray C. M. G., F.G.G.	Director Geolog. Survey, Newf'd.	St. Johns, Newfoun'd.
Edwin A. Hill	Attorney, etc., Boston and New York Air Line Railway	New Haven, Conn.
C. D. Ward*	Windsor Hotel	Jersey City.
Lewis Bass	Director Dudley Observatory	Albany, N. Y.
Charles A. Schott	Assistant U.S. Coast and Godetic Survey	Washington.
David H. Jerome	Governor of Michigan	Lansing, Mich.
W. T. Sampson	Commander U.S.N., Assistant to Supt. Naval Observatory	Washington.
Wm. Brydone Jack	Pres. University, New Brunswick	Fredericton, N. B.
John B. Hamilton	Supervising Surg.-General, U.S. Marine Hospital Service	Washington.
H. F. McLeod, M. I., C. E.	Resident Eng., Canadian Pacific Railway	Drynock, B. Columbia.
Jacob M. Clark*	C. E.	New York.
H. P. Dwight	Gen. Man. Great N.-West Tel. Co	Toronto, Can.
William F. Bradbury ...	Head Master, Cambridge High School	Cambridge, Mass.
M. Giddings		Bangor, Me.
J. W. Mallett	Prof. Chemistry, University of Virginia	Albermarle Co., Va.
D. Hudson Shedaker ...	Civil Engineer	Philadelphia.
John Twigg	Town Clerk	Picton, Ont.
E. P. Dunnington	Prof. Anal. Chemistry, Univ'y of Virginia	
Francis H. Smith	Prof. Natl. Phil'y, University of Virginia	
Clarence J. Blake	Fellow Am. Acad. Arts and Sciences	Boston.
Wm. M. Thornton	Adj. Prof. Eng., University of Virginia	
Albert Chapman Savage	City Engineer	El Paso, Texas.
M. C. Fernald	President State College	Orono, Me.
John H. Flake		Boston, Mass.
Ed. Fontaine	Professor, etc., etc.	Jackson, Wis.
Fred Brooks*	A. E. Ferro Carril Cen. Mexicano	San Luis Potosi, Mex.
Charles F. Dowd, A. M.	President Temple Grove Sem'y.	Saratoga Springs.